

What is claimed is:

1. A cooling system for use with a storage system having a storage device
2 that generates heat while in operation, the cooling system comprising:
a drive rail that is coupled to the storage device;
4 a rail channel that is at least partly bounded by the drive rail; and
a fluid source that provides a fluid, wherein at least a portion of
6 the fluid provided by the fluid source is moved through the rail channel to
transfer heat to the drive rail that is generated by the storage device.
2. The cooling system of claim 1 wherein at least approximately
2 15% of the fluid from the fluid source is moved through the rail channel.
3. The cooling system of claim 1 wherein at least approximately
2 35% of the fluid from the fluid source is moved through the rail channel.
4. The cooling system of claim 1 wherein at least approximately
2 15% of the heat generated by operation of the storage device is transferred to
the drive rail and removed through the rail channel.
5. The cooling system of claim 1 wherein at least approximately
2 35% of the heat generated by operation of the storage device is transferred to
the drive rail and removed through the rail channel.
6. The cooling system of claim 1 wherein the drive rail is made from
2 material with a thermal conductivity of at least approximately 3W/IN-C°.
7. The cooling system of claim 1 wherein the drive rail includes a
2 channel side and an attachment side, the storage system being coupled to the
attachment side, wherein the rail channel is positioned adjacent to and at least
4 partly bounded by the channel side of the drive rail.

2 8. The cooling system of claim 7 wherein the drive rail has a plurality
of fins that cantilever away from the channel side of the drive rail.

2 9. The cooling system of claim 8 wherein the fins are substantially
perpendicular to the channel side of the drive rail.

2 10. The cooling system of claim 8 wherein the fins extend
substantially the entire length of the drive rail.

2 11. The cooling system of claim 7 further comprising a bracket that is
coupled to the attachment side of the drive rail, the bracket securing the
storage device to the drive rail.

2 12. The cooling system of claim 11 wherein the bracket is
substantially U-shaped.

2 13. The cooling system of claim 11 wherein the bracket is made from
material with a thermal conductivity of at least approximately 3W/IN-C°.

2 14. The cooling system of claim 11 wherein the bracket is adapted to
receive the storage device and to couple the storage device to the attachment
side of the drive rail, the bracket substantially surrounding three sides of the
4 storage device.

2 15. The cooling system of claim 11 wherein the storage system
includes a plurality of storage devices, and wherein the drive rail is coupled to
at least two of the storage devices, the at least two storage devices being
4 positioned so that a top surface of one storage device is directly beneath a
bottom surface of another storage device, wherein the distance between the
6 surfaces is less than approximately 0.375 inches.

16. The cooling system of claim 11 further comprising a first thermal
2 gasket situated between the bracket and the storage device, the first thermal
gasket being made from a material with a thermal conductivity of at least
4 approximately 1W/M-K.

17. The cooling system of claim 16 further comprising a second
2 thermal gasket situated between the bracket and the storage device, the
second thermal gasket being made from a material with a thermal conductivity
4 of at least approximately 1 W/M-K.

18. The cooling system of claim 11 further comprising a rail thermal
2 gasket situated between the bracket and the drive rail, the rail thermal gasket
being made from a material with a thermal conductivity of at least
4 approximately 1W/M-K.

19. The cooling system of claim 1 further comprising a housing
2 adapted to substantially surround the drive rail, wherein the rail channel is at
least partly bounded by the housing.

20. A storage system including the cooling system of claim 1 and a
2 storage device coupled to the cooling system.

21. A cooling system for use with a storage system having a storage
2 device that generates heat while in operation, the cooling system comprising:
a drive rail having a channel side and an attachment side;
4 a bracket that secures the storage device to the attachment side
of the drive rail, the bracket transferring heat away from the storage
6 device to the drive rail; and
a fluid source that provides a fluid, wherein at least a portion of
8 the fluid is moved near the channel side of the drive rail to transfer heat
to the drive rail that is generated by the storage device.

22. The cooling system of claim 21 further comprising a rail channel
2 that is at least partly bounded by the drive rail; wherein a portion of the fluid
provided by the fluid source is moved through the rail channel.

23. The cooling system of claim 22 wherein at least approximately
2 15% of the fluid from the fluid source is moved through the rail channel.

24. The cooling system of claim 22 wherein at least approximately
2 15% of the heat generated by operation of the storage device is transferred to
the drive rail and removed through the rail channel.

25. The cooling system of claim 21 wherein the drive rail is made
2 from material with a thermal conductivity of at least approximately 3W/IN-C°.

26. The cooling system of claim 21 wherein the storage device
2 couples to the attachment side of the drive rail.

27. The cooling system of claim 21 wherein the drive rail has a
2 plurality of fins that cantilever away from the channel side of the drive rail.

28. The cooling system of claim 27 wherein the fins are substantially
2 perpendicular to the channel side of the drive rail.

29. The cooling system of claim 27 wherein the fins extend
2 substantially the entire length of the drive rail.

30. The cooling system of claim 21 wherein the bracket is
2 substantially U-shaped.

2 31. The cooling system of claim 21 wherein the bracket is made from
material with a thermal conductivity of at least approximately 3W/IN-C°.

2 32. The cooling system of claim 21 wherein the bracket substantially
surrounds three sides of the storage device.

2 33. The cooling system of claim 21 wherein the storage system
includes a plurality of storage devices, and wherein the drive rail is coupled to
at least two of the storage devices, the at least two storage devices being
4 positioned so that a top surface of one storage device is directly beneath a
bottom surface of another storage device, wherein the distance between the
6 surfaces is less than approximately 0.375 inches.

2 34. The cooling system of claim 21 further comprising a first thermal
gasket situated between the bracket and the storage device, the first thermal
gasket being made from a material with a thermal conductivity of at least
4 approximately 1W/M-K.

2 35. The cooling system of claim 21 further comprising a rail thermal
gasket situated between the bracket and the drive rail, the rail thermal gasket
being made from a material with a thermal conductivity of at least
4 approximately 1W/M-K.

2 36. A storage system including the cooling system of claim 21 and a
storage device coupled to the cooling system.

2 37. A method for cooling a storage device that generates heat while
in operation, the method comprising:
 providing a drive rail;
4 coupling the storage device to the drive rail;

6 providing a rail channel positioned adjacent to and at least partly
 bounded by the drive rail; and
 directing a fluid through the rail channel to transfer heat to the
8 drive rail that is generated by the storage device.

 38. The method of claim 37 including the step of transferring at least
2 approximately 15% of the heat generated by the operation of the storage
 device to the drive rail.

 39. The method of claim 37 wherein the step of providing a drive rail
2 includes providing a drive rail made from material with a thermal conductivity of
 at least approximately 3W/IN-C°.

 40. The method of claim 37 wherein the step of providing a drive rail
2 includes providing a drive rail having a plurality of fins that cantilever
 substantially perpendicularly away from at least one side of the drive rail.

 41. The method of claim 37 further comprising the step of coupling a
2 bracket to the drive rail, wherein the bracket receives the storage device on one
 side of the drive rail.